

**REMARKS**

With the entry of this Response, Claims 1-14 are pending. Claims 2 and 12 have been previously withdrawn, and in this Response, Applicants have canceled Claims 6-8, added Claim 14, and amended Claims 1-4 and 13. Support for the amendments to Claims 1 and 2 can be found in the as-filed claims and in the specification at least at page 14 (line 22) through page 16 (line 4), in Tables I and II, and Figure 1. Support for the amendments to Claims 3-4 can be found in the specification at least at page 16 (line 15) through page 17 (line 2) and in Figure 1. Support for the amendments to Claim 13 can be found in the specification at least at page 14 (lines 22-30), page 15 (line 29) through page 16 (line 17). Support for new Claim 14 can be found in the as-filed claims and in the specification at least at XXpage 17, lines 15-32. In view of the subsequent remarks, Applicants respectfully request allowance of all the pending claims.

**IN-PERSON EXAMINER INTERVIEW**

Applicants and Applicants' representatives thank Examiner Ahmed and SPE Sheikh for the in-person interview, held 18 May 2010. In this Response, Applicants have incorporated claim language as discussed at the interview and have provided additional arguments distinguishing Applicants' currently pending claims from the method of Sugahara. Applicants request that the Examiner withdraw all rejections and allow the pending claims.

**35 U.S.C. § 112, FIRST PARAGRAPH, REJECTION**

The Office Action rejected Claims 1, 3-11, and 13 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. (Office Action, p. 2). In this Response, Applicants have amended Claim 1. Applicants respectfully submit that the amendments to Claim 1 render this rejection moot, and in light of these amendments, Applicants respectfully request that the Examiner withdraw this rejection.

**35 U.S.C. § 103(A) REJECTION**

***A. Claims 1, 3-8, 10, and 11***

The Office Action rejected Claims 1, 3-8, 10, and 11 under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 3,617,215 issued to Sugahara *et al.* (hereinafter "Sugahara"). The Office Action stated, "It would have been obvious to a person of ordinary skill in the art at the time the

invention was made to disclose a method of preparing a mineral composition by acid extraction of clay soil, as taught by Sugahara.” (Office Action, p. 5). Applicants respectfully traverse this rejection to the extent that it applies to the claims as amended.

Under 35 U.S.C. § 103(a), the Patent Office bears the burden of establishing a *prima facie* case of obviousness. A *prima facie* case of obviousness requires: (1) that there be a suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the teachings of reference or to combine the teachings of multiple references; (2) that there be a reasonable expectation of success; and (3) that the prior art reference, or references when combined, teach or suggest all of the elements of the claim. (*See, e.g.*, M.P.E.P. § 2143). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and cannot be based on Applicants’ disclosure. (*See, e.g., In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991); *In re Fine*, 87 F.2d 1071, 1074 (Fed. Cir. 1988)). Furthermore, rejections based on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be explicit analysis including some rational underpinning to support the legal conclusion of obviousness. (*K.S.R. Int’l Co. v. Teleflex, Inc.*, 550 U.S. 14 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006))). If the references do not teach each and every claimed element, then a finding of obviousness fails.

Applicants respectfully submit that Sugahara fails to teach or suggest Applicants’ currently claimed method. Sugahara is directed to a method that requires two acid treatment steps that remove “acid-soluble basic constituents” to yield an “active clay” or “finely divided silica”. Sugahara discloses an acid treatment for alumina-silica type clay, which comprises a first dry acid treatment step in which the alumina-silica type clay is mixed with an acid to form a plastic or solid reaction product, and a second extraction step using an acid with a pH not more than 1.0 in which the basic metal constituents contained in the reaction products are removed. (*See, e.g.*, Col. 2, lines 6-13 and Col. 2, lines 22-36). For example, Sugahara states “the invention relates to a new acid treatment process of alumina-silica type clay which comprises in combination a dry acid treatment step wherein said alumina-silica type clay is admixed with an acid to form directly a nonfluid solid reaction product, and extraction step wherein the basic metal constituents contained in said reaction product are extracted and removed.” (Col. 1, lines 7-13). Sugahara teaches that acid is added at each of these two steps. This is the only method

disclosed in Sugahara, and it is not a teaching or a suggestion of Applicants' currently claimed invention.

An important feature of the method of Sugahara is the "nonfluid solid reaction product" that is formed in the first step, the reaction step, by "intimately admixing the acid or an aqueous solution thereof" with the starting clay material. (Col. 4, lines 38-42). The first acid treatment step of Sugahara yields a plastic or solid reaction product, which is then "granulated into an optional form". (Col. 6, lines 29-30). If the first acid treatment step yields a reaction product that is "creamlike, then it can be fed or sprayed either into a heated gas atmosphere or onto a heated plate in streamlets or small drops, thus removing the water content of the mixture and at the same time reacting the acid with the basic constituents contained in the mixture to form concurrently the reaction product into granules or small aggregates." (Col. 6, lines 35-42). "Alternatively, the mass of plastic or solid reaction product formed in a suitable vessel or a conveying means can be roughly ground into small aggregates of suitable size."

Sugahara teaches that "The important thing is to ensure that the reaction conditions are so established that a nonfluid solid reaction product is obtained on termination of the reaction." (Col. 5, lines 18-20). After the first acid treatment step, wherein clay and acid are admixed, and a solid particle is formed, then a second acid treatment step is performed on the solid particle, "the basic metal constituents contained in the solid reaction product are extracted and removed therefrom with an aqueous medium of a pH not more than 1, and preferably not more than 0.5." (Col. 6, lines 51-54). The method of Sugahara requires this second acid treatment step to be performed with an acid solution having a pH of less than 1, because if the pH is greater than 1, then "there is a tendency of the salts of the basic metal constituents to become susceptible to hydrolysis to result in a decline in the quality of the product. Hence, the aqueous medium used in the invention process is one having a pH of not more than 1, and preferably not more than 0.5." (Col. 6, lines 55-60). These are not teachings or suggestions of Applicants' currently claimed invention.

The examples of Sugahara further teach the two acid treatment steps and particle formation method. In Example 1, Sugahara teaches a method in which clay is mixed with sulfuric acid **(1)** in a first step to form a reaction product that is granulated. In the second step, the granulated solid reaction product is placed in a glass tube and exposed to a sulfuric acid solution **(2)** having a pH of 0.5 to elute the soluble salts of the basic metal constituents of the

reaction product. When cooled, the extracted liquid hardened into a solid iron-containing aluminum sulfate. “The cylindrical granular products maintained their granular form without becoming slurrylike until the completion of the water-washing operation.” (Col. 9, lines 25-28). The method requires formation of solid granular particles by the interaction of an acid and the clay in a first acid treatment, and the particles maintain their physical form as a solid granule throughout the second acid treatment.

In Example 2, Sugahara teaches a method in which clay is mixed with sulfuric acid **(1)** in the first step to form a small flaky granular reaction product. In the second step, the reaction product was introduced into a sulfuric acid solution **(2)** having a pH of 0.5, and the soluble salts formed by the reaction were extracted and separated, generating “an acid-treatment completed acid clay.” (Col. 10, line 6 through Col. 11, line 15). In Example 3, a finely divided silica is formed. The clay of Example 1 was thoroughly mixed with sulfuric acid **(1)** using a kneading molder and the mixture was granulated. The resulting granules were subjected to an acid **(2)** having a pH of 0.5 to extract and recover the soluble basic constituents. It is unclear from Example 3 whether there are two or three acid treatment steps in this method. Ultimately, a finely divided silica product as well as a solid-iron containing aluminum sulfate product were obtained. (Col. 11, line 17 through Col. 12, line 24). In Sugahara, Examples 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15 use the **two-** (or three) step acid treatment steps disclosed in Examples 1, 2, and 3.

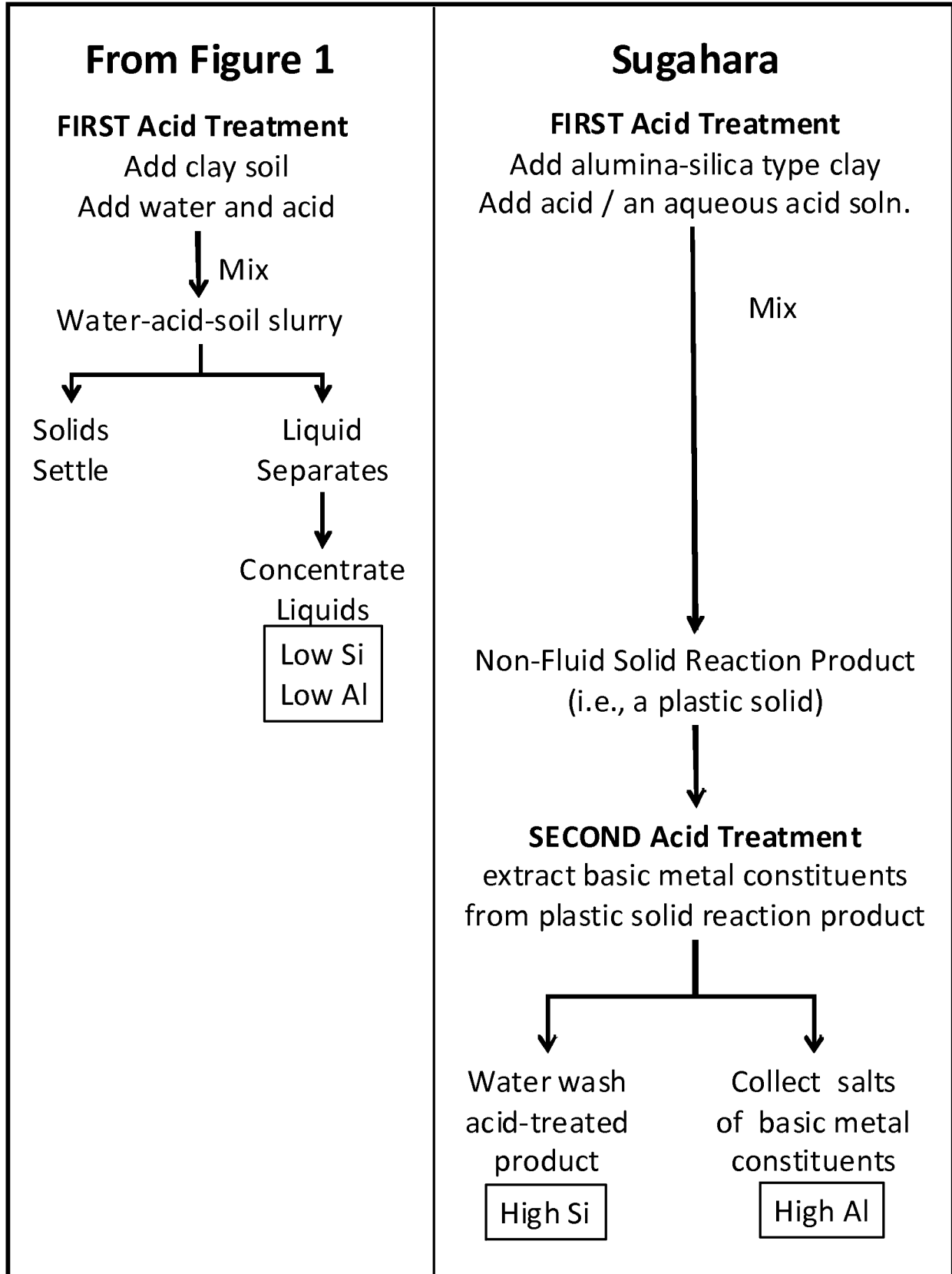
Sugahara clearly teaches a method requiring at least two acid treatments. Sugahara teaches that it is “[a]n important feature of the invention process” to form “the nonfluid solid reaction product by intimately admixing the acid or an aqueous solution thereof”. (Emphasis added) Sugahara at Col. 4, lines 38-40. Once this “important” step of acid plus starting material clay results in the “solid reaction product”, the “extraction step” occurs. Sugahara at Col. 6, lines 20-26. In the “extraction step”, the “basic metal constituents are removed by using “an aqueous medium of a pH not more than 1, i.e., an acid treatment. As taught by Sugahara, “[a]nother important advantage of the invention process is that the operation of extracting the basic metal constituents from the reaction product is very easily accomplished as a result of having obtained the reaction product in a plastic or a solid state by submitting the material clay to a dry acid treatment step.” Emphasis added) Sugahara at Col. 7, lines 49-54. Sugahara repeatedly teaches that it is important to the invention to have two acid treatments. Sugahara

does not provide a teaching or suggestion that renders Applicants' currently pending claims obvious.

The method taught by Sugahara for making active clay or finely divided silica requires two acid treatment steps. The first acid treatment step admixes an acid and a clay to form a mixture that is granulated into solid, dry particles (the "reaction product"). If necessary, the acid/clay mixture is dried to remove any water present. These solid particles are then extracted in the presence of an acid with a pH of 1 or less (the "extraction medium"), and the salts of basic metal constituents (*i.e.*,  $\text{Al}_2\text{O}_3$ ,  $\text{FeO}$ ,  $\text{Fe}_2\text{O}_3$ ,  $\text{CaO}$  and  $\text{MgO}$ ) are removed by this acid extraction step. The extraction from the salts of the reacted basic constituents forms a "solid iron-containing aluminum sulfate" (Col. 9, lines 20-23, and Col. 3, lines 46-48).

The amount of basic metal constituents to be removed depends on which one of the other two products resulting from the two acid treatment method is desired. When active clay is the intended product, about 10 to 90 percent of basic metal constituents are removed. When finely divided silica is desired, "as much as possible of the total basic metal constituents [in the starting material] is removed." (Col. 3, line 75 through Col. 4, line 6). This is a two step method requiring the addition of an acid to clay to form solid particles, and the extraction of the basic metal constituents from the solid particles. "Thus, in this embodiment of the present invention, as it is possible to maintain the acid treated clay in a form of granules or small aggregates throughout the extraction operation, such advantages as easy separation of the product from the extraction medium and easy after treatment are brought about." (Col. 7, lines 24-28).

To visualize these distinctions, Applicants herein provide a schematic of the method of Sugahara below. Applicants also refer the Examiner's attention to Appendix A, which is located on the last page of this Response. Appendix A summarizes the method of Sugahara and provides, in Sugahara's own words, insight into the two acid treatment steps of the method. Applicants respectfully submit that the skilled person would recognize that Sugahara fails to teach or suggest a method for preparing an extracted mineral element composition as currently claimed. Sugahara teaches away from Applicants' currently claimed process by requiring at least two acid treatments and the formation of a solid granular product which is extracted in the second acid treatment step. The method of Sugahara does not provide a teaching or suggestion of Applicants' currently claimed invention.



For at least these reasons, Sugahara fails to teach or suggest every element of Applicants' currently pending claims. Therefore, Sugahara fails to render as obvious independent Claim 1. As "dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious" (*In re Fine*, 5 U.S.P.Q.2d 1569, 1600 (Fed. Cir. 1988)), Applicants submit that Sugahara also fails to render as obvious dependent Claims 3-5, 10, and 11. Therefore, Applicants respectfully request that the Examiner withdraw this rejection and allow these claims.

***B. Claims 1, 3-11, and 13***

The Office Action rejected Claims 1, 3-11, and 13 under 35 U.S.C. § 103(a) as obvious over Sugahara in view of published U.S. Patent Application No. 2004/0258597 to Michalakos *et al.* (herein "Michalakos"). (Office Action, p. 7). Applicants respectfully traverse this rejection to the extent that it applies to the claims as amended.

The Office Action applied Sugahara in this § 103(a) rejection in the same way and for the same disclosure for which the Office Action applied Sugahara in the § 103 rejection discussed above. Applicants respectfully submit that the skilled person would recognize that Sugahara fails to teach or suggest a method for preparing an extracted mineral element composition as currently claimed. Sugahara teaches away from Applicants' currently claimed process by requiring at least two acid treatments and the formation of a solid granular product which is extracted in the second acid treatment step. The method of Sugahara does not provide a teaching or suggestion of Applicants' currently claimed invention.

The Office Action cited Michalakos for teaching that water purification by reverse osmosis was known in the art at the time that Applicants filed the present application. The teaching of Michalakos does not supplement what Sugahara fails to teach or suggest. Thus, the combination of Sugahara and Michalakos does not result in a method for preparing an extracted mineral element composition as currently claimed by Applicants. This combination also fails to provide to the skilled person with the necessary guidance or motivation to arrive at Applicants' currently pending claims. Therefore, the combination of Sugahara and Michalakos fails to render as obvious independent Claim 1.

As “dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious” (*In re Fine*, 5 U.S.P.Q.2d 1569, 1600 (Fed. Cir. 1988)), Applicants assert that Sugahara also fails to render as obvious dependent Claims 3-5, 9-11, and 13. Therefore, Applicants respectfully request that the Examiner withdraw this rejection and allow these claims.



**CONCLUSION**

The foregoing is a complete response to the Final Office Action dated June 24, 2010. Applicants respectfully submit that the pending claims are patentable. Early and favorable consideration is solicited.

Applicants file this Response solely to facilitate prosecution. As such, Applicants reserve the right to pursue claims of broader or similar scope as originally filed in a continuation application or other application after allowance of the present application. Applicants do not concede that the current or past rejections are correct and reserve the right to challenge such rejections later in prosecution or on appeal. Accordingly, any amendment, argument, or claim cancellation is not to be construed as abandonment or disclaimer of subject matter. Because certain of the current amendments may include broadening amendments, Applicants respectfully request that the Examiner revisit any previously reviewed references cited in this application to further ensure that the currently pending claims remain patentable over any previously reviewed references. If the Examiner believes there are other issues that can be resolved by a telephone interview, or that there are any informalities that remain in the application that may be corrected by the Examiner's amendment, then a telephone call to the undersigned attorney at (678) 420-9428 is respectfully solicited.

With this Response, Applicants also submit a Request for Continued Examination and a credit card payment. The credit card payment is in the amount of \$810, which represents the large entity fee for a Request for Continued Examination pursuant to 37 C.F.R. § 1.114. Applicants believe that this is the correct amount due; however, Applicants hereby authorize the Commissioner to charge to Deposit Account No. 14-0629 any additional fee that may be required to effect the entry of this Response, or to credit to the same account any overpayment of fees.

Respectfully submitted,

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APPENDIX A

## METHOD OF SUGAHARA

### FIRST Acid Treatment

In this invention, the alumina-silica type clay containing an acid-soluble basic constituent is intimately admixed with an acid or an aqueous acid solution thereof to form directly non-fluid solid reaction product. The “non-fluid solid” means a state which is plastic as well as perfectly solid. (col. 3, ll. 55-60)

*An important feature of the invention process resides in directly forming the nonfluid solid reaction product by intimately admixing the acid or an aqueous solution thereof. . . (col. 4, ll. 38-40)*



### SECOND Acid Treatment

The plastic or solid reaction product which has been obtained by means of the hereinbefore described dry acid treatment step contains the basic metal constituents to be removed as salts of the acid used in the treatment. (col. 6, ll. 46-50)

*Another important advantage of the invention process is that the operation of extracting the basic metal constituents from the reaction product is very easily accomplished as a result of having obtained the reaction product in a plastic or solid state by submitting the material clay to a dry acid treatment step. (col. 7, ll. 49-54)*